Homework #1, PHY 674, 25 August 1995

(X1). Let M and N be sets (not empty) and $f : M \to N$ be a map. Show that f is bijective if and only if there is a map $g : N \to M$ such that the compositions $f \circ g$ and $g \circ f$ are the identities id_N and id_M of N and M. (4 points).

(X2). Show that there is only one neutral (or unit) element in each group. (4 points).

(X3). Show that for each element $x \in G$, there is only one inverse x^{-1}. (4 points).

(X4). Is there a group with zero elements ? (1 point)

(X5). Find all groups with one, two, three, four, and five elements and write down their multiplication tables. Which of these groups are Abelian ? Hint: Use Lagrange's theorem. (4 points).

Due Date:
Friday, September 1st, 1995, 2 pm

in class or in the green homework box inside the south entrance to Room 12.

Dr. Stefan Zollner, A205 Physics, 294-7327, August 25, 1995.
Send questions to: `zollner@iastate.edu`.